

The Files

4 October 1956

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Trip and Progress Report, [REDACTED] Task Order 2

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1. On 12 and 13 September 1956, I visited the plant of [REDACTED] California to determine the status of the RS-13B system. Those contacted at [REDACTED] were:

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2. The general progress of the development was reviewed with respect to any anticipated changes in delivery and cost. The initial indication are that there will be a delivery delay which may amount to as much as two or three weeks, and an over-run cost. At this time [REDACTED] is unable to give an accurate estimate of what the over-run and delivery schedule delay will be. I emphasized that we should be advised as soon as possible when such information becomes known. I further advised that under no circumstances should the delivery of the first items be extended beyond 1 January as operational requirements make it mandatory that we have some equipment in our possession by that time. I further determined that the probable reason for the cost of over-run was due largely to the under estimate of transmitter design and the cost of parts to provide better reliability than that expected of the original prototype. The delay, if any, will probably be due to late schedules of outside suppliers rather than major design difficulties on the part of [REDACTED]

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3. A number of specific questions were raised by [REDACTED] which are as follows:

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A. According to the specification all external surfaces are to be finished in a non-spectral black. In the interest of time and cost it is indicated that a black anodize should be used on aluminum surfaces. According to JAN specifications nickel should not be used in contact with aluminum under conditions of extremely high humidity or around salt spray, but may be used under less severe conditions. This is a problem which was pointed up by questioning the matter of various screws and certain other items of hardware. It is felt that a black nickel finish will be satisfactory on external steel parts and sheet screws.

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B. The power plug for the ATF-3 printer was discussed at some length. Several types of plugs were suggested including a Winchester, a Noreapp, which is similar to the Telex type, and a Continental G-20. It has been resolved that the Continental G-20 series with 310 is the best solution, provided they are obtainable.

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C. [ ] maintains that the loading circuits in the RS-1, the RT-1B and the RT-4 do not meet the complete specification for correction over the impedance range of from 50 ohms to 1200 ohms with a plus and minus phase angle of  $45^\circ$ . According to their calculations, capacities as high as 1600 micro-micro farads are required in the output condenser for this pi net work. The larger condenser in any of the systems is less than  $1/3$  of this value, therefore [ ] maintains that the systems currently in use do not meet this phase angle requirement. [ ] is concerned about the ability to meet the extreme requirement at 50 ohms for plus  $45^\circ$  compensation. If we do not require that optimum transfer be made into an inductive antenna at 3 megacycles, this large capacity could be reduced considerably. As the frequency of emission is increased to approximately 8 megacycles and above, this large capacity ceases to be a problem as the magnitude is reduced to approximately a half or less.

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D. [ ] wanted to know if it is satisfactory to fasten the various items to a mounting plate from the rear. I indicated this would be satisfactory provided the battery charger is removable from the top face and secondly, that the entire system must be operable if removed from the base plate.

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E. [ ] expressed concern regarding the antenna change over relay. According to JAN specification all relays must be hermetically sealed. After considerable investigation it was determined that the only relay suitable for such operation is excessively large to use in this instance. They wondered if an unsealed relay would be satisfactory provided the electrical specifications are suitable. Inasmuch as the relay will be shielded and otherwise protected by the case of the transmitter, I agreed to the use of an unsealed unit provided it meets all necessary safety and electrical specifications.

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4. I spent considerable time in the laboratory with [ ] where a number of the problems with the system were examined. The AC power supply and the transmitter have been completely breadboarded. In this connection, a number of questions have arisen concerning the power supply. Aside from the size and weight of the transformer, which now appears to be reasonably resolved the point of greatest concern is regarding the selenium rectifiers used in the high voltage supply. These are shown on the attached [ ] drawing No. 2896, the schematic for the AC power supply. These are shown as part No. CR-101, 102, 103 and 104. Consistent with the physical size aspects of the RS-13B system, these rectified units are the largest available in the current and voltage ratings suitable for such a device. As will be noted in the schematic

*Riv/SS*  
*What do*  
*original R/D*  
*tests on*  
*these*  
*equipments*  
*show?*  
*RR*

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the intermediate voltage of 225 volts is taken from the center half of the secondary watt. This places an additional current drain across CR-101 and CR-103 in addition to the current drain across these units developed by the 450 volts. This means that these units are running at a slightly higher level than CR-102 and CR-104. Under normal operating conditions of high speed keying, or during the recognition keying in a start period, this presents no problem. However, when keying in manual A-1 condition, which is a steady CW signal, these rectifier units are being over rated and have a definite tendency to overheat. Reduced power output is being considered to alleviate this condition. This is noted in Paragraph 4 of the attached [REDACTED] minutes of the meeting.

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5. Considerable backwave was noted in the output when keying in the A-1 mode of operation. This was due largely to the fact that the oscillator was free running and that keying is accomplished by placing the hand key in the cathode of the final. I suggested that the key be placed in the cathode of the oscillator so that when the key is in the up position, the oscillator would be inactive. This change was made and found to be satisfactory and thereby eliminated the backwave radiation.

6. It has generally been determined that there will be six operating controls on the face of the transmitter, which will include the band-change switch, and the function switch, and further there will be no test points on the face of the transmitter as had been earlier provided on the original RS-13 system.

7. In general it appeared that the development of the RS-13B system is satisfactory, with deliveries to start sometime in December.

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Attachments:

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Schematic diagrams  
Minutes of meeting from [REDACTED]

OC-E/R&D-EP/FCS:jac (5 October 1956)

cc: R&D Subject File  
Monthly Report (2)  
Lab  
Dev-ep